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ENG 456

Dr. Green

July 23, 2023

Long Form Essay: (3000 words)

The Quest for Migraine Relief

By Anna M. Spafford

It comes in deepest dark, riding

a nightmare. You wake yelping,

you think from your fear, but discover

this distress is caused by pain.

The migraine descends, an unwished-

for gift, like a not-very-pleasant

prediction from a fortune-telling gypsy.

Pleading for it to depart never works.

Better to invoke blessing, welcome

the unbidden guest—it'll get worse

before it gets better. Then finally,

as Emily was wise enough to foresee,

"After great pain, a formal feeling comes."

When relief blossoms so sweet, so

unassuming, you wonder why

the rest of humanity isn't spinning

in ecstasy for the opportunity to

feel like this. Just ordinary.

By Barbara Schmitz (poetryfoundation.org)

The devastating effects of migraine touch every aspect of one's lives, and researchers are on a quest to find out why migraine attacks happen and what can be done to make the sufferers lives more livable. It seems everyone knows someone who has migraine attacks, or they suffer from it themselves, and it increases urgency for the medical field to advance knowledge and treatments to help those who suffer. Headache pain has been talked about throughout history, but Hippocrates, who was considered the father of medicine, was the first to really report on the affects of migraine, which proves that migraine attacks are something that people have suffered

from for a very long time, and the advancements in recent years have helped headache experts to thrive in their area of expertise as far as prevention and treatments.

When Alexandra, a migraine sufferer, woke up this morning she felt the instant pounding headache pain that she has about twelve to fifteen days a month. She is only 25, and her mother also went through the same headache pain, so she is very familiar with how migraines affect one's life. Her pain situates itself to one side of her head, throbs relentlessly, and she knows today will be one of those days. Some days it comes with the inability to be exposed to bright lights, and so she stays in darker rooms to try to minimize the pain. Other times she feels extremely sensitive to sounds and must try to stay somewhere quiet and dark like her bedroom, which does not cure the pain, but rather just reduces the pain as much as possible. On a really bad day, Alexandra may experience what is called an aura where she sees flashing lights, and numbness in parts of her body. Today is definitely one of those days as she feels the aura coming on and she resigns herself to another day of resting and hiding away in her bedroom. She is struggling with feeling like she cannot take any more days like this and feels discouraged.

Michael is plagued by migraine pain as well. Today he did a hard workout as he likes to stay fit, but towards the end of the workout, he was already in intense pain again. He is a father of four and has been married for fifteen years. He works at a software engineering firm writing computer code. He often has such throbbing pain in his head that he cannot see, and at times he has nausea and vomiting. This could be one of those times. He feels best during these times if he lays down, which is not feasible at his job. He feels limited in what he can do and worries that his work may think he is making it up and he worries he is not meeting their expectations. He feels the stigma associated with having migraine attacks. People he works with tell him regularly how it cannot be that awful since it is just headache pain, and maybe he should just take some

Tylenol. He feels guilty that he is not as much of an active participant in his life with his wife and children. This has left him feeling hopeless and depressed.

Billions of people around the world suffer from migraine attacks each year. Hippocrates was the first to document the symptoms associated with migraine, and throughout time many societies have documented severe headache pain. Most prevention and treatment options today do not cure or stop migraines altogether, but they can make life more livable and offer some relief. For sufferers like Alexandra and Michael, what is available to treat their migraine pain is not always sufficient to relieve pain or to prevent migraine attacks and they are at times hesitant to stay on some medications because they come with many side effects that are nearly as debilitating as the pain. What is also remarkable about migraines is that every sufferer experience different kind of symptoms and therefore not all treatment looks the same for everyone. What is the same for most sufferers is the way being in pain for days on end really wears down a person's mental health, and they begin to also suffer from sadness and despair.

According to the Department of Neurology and Headache Center, University Hospital in Germany and the Department of Neurology, Mayo Clinic, Phoenix, Arizona, migraines are the third most prevalent and sixth most disabling medical disorder in the world. Migraines are diagnosed by medical history and patient history. Chronic migraines are defined as having more than 15 headaches in a month. Neurologists and headache specialists can do an MRI to measure areas of the brain and to confirm the number of headaches one has in a month. There are other types of headaches that are sometimes confused with migraines, like a cluster headache. Researchers are trying to find out how treatments available today help to minimize pain and are looking to develop more treatments for the prevention and treatment of migraine attacks.

When visiting a headache clinic, one can expect to be asked a series of questions that pertain to headache symptom history; how long they have had them, what symptoms they experience, what may have triggered their headache or symptoms associated with it, and how they affect their life. One will also be asked who else in their family suffers from headaches. Specialists will need their medical records and have a complete medical history. Keeping a headache diary before their visit will help the doctor determine what is causing them and how to treat them. The headache diary should contain what time of day they start, what they did before they start (like what you ate or what you were doing), what they feel like, how long they last, and other symptoms one experienced. This information guides the headache specialist in their development of an overall picture of the sufferer's experience and helps them diagnose and treat their headaches.

Ergotamine and analgesics have been standard treatments for migraines but have not shown any promise regarding treatment for migraines. Doctors are trying something known as Triptans, a class of medication called a selective serotonin receptor agonist, which works like a brain chemical. Triptans reduce inflammation in the blood vessels in the brain, increase serotonin, and reduce sensitivity to sound and to light. Triptans are showing improvement in the severity of the migraines. Triptans also work by binding to the serotonin receptors of 5-HT1B and 5-HT1D, which leads to narrowing of the cranial arteries which dilate during a migraine attack causing pain. They also block the pain signals from being sent to the brain.

Sumatriptan was discovered by Dr. Patrick Humphrey who is an expert in the field of headache research and is used to treat the pain associated with a migraine. Sumatriptan is not a painkiller, and therefore does not work on cluster headaches. Humphrey's wife suffered from migraine attacks during her menstrual cycle, which led him on a quest to work on finding

something that could help her pain. Dr. Patrick Humphrey is quoted as saying, “As a consequence of the advances in research, triggered by the “triptan revolution,” we are better positioned now than ever to design new drugs, particularly prophylactic drugs that might provide superior therapeutic alternatives for migraineurs. This opportunity emanates from our attempts to better understand how the triptans work and consequently better understand the pathophysiology of the disease itself, which in turn is helping to generate new pharmacological ideas.” Dr. Humphrey was ahead of his time when he predicted advances would be made in migraine treatment due to the discovery of triptans, especially the drug, Sumatriptan.

At the Department of Systems Neuroscience, University Medical Center Hamburg-Eppendorf in Germany, Kröger and May, two neuroscientists who are both experts in the field of headaches, used functional MRI during the research study to explain the therapeutic effects of triptans compared with aspirin and a placebo in the treatment of acute migraine attacks. While sticking thin wires under the skin to stimulate the nerves in the brain, they measured blood oxygen level-dependent signal intensity in the nerves in the face that relay pain to the brain, the thalamus which is the main relay center for the brain, and the part of the brain which stimulates pain receptors in the skin of the face. They found there was an increase in the blood oxygen level-dependent signal, which was not true of the aspirin and the placebo during the research study. These findings explained why triptans work best in migraine but not for other pain or in cluster headaches. The more that is understood about how medications work, the better the developments are in the treatment of migraines.

Headache specialists today prescribe many medications for migraine prevention that are for other things like hypertension and antidepressants. These medications were discovered to have benefit to the migraine sufferers by accident when they were prescribed for other issues but

patients reported they suffered less migraine attacks when used. Some examples of these types of medications include medicines for hypertension, anti-depressants, and anti-convulsants. This led to research trials. They were able to compare them to the use of a placebo, which is called a placebo-controlled study, and they found the medications to reduce the amount of migraine days per month by about 1 percent, which is helpful but not a complete reduction. The medications that showed promising results in prevention of migraines were amitriptyline, flunarizine, fluoxetine, metoprolol, pizotifen, propranolol, topiramate, and valproate. This research suggests that migraine prevention may have its limitations since the medications are only mildly helpful in preventing migraines, and the medications tend to have side effects that lead to poor compliance by patients with taking the medications. Migraine sufferers tend to still need to have pain management, so while these findings are helpful and promising, there is much work left to be done in way of research.

Research has also been done by using humanized antibodies, which are antibodies from rodents which have been altered to be closer to human antibodies, on the CGRP receptors. CGRP is a peptide that is found in the nervous system, and these are being used in clinical trials to help prevent migraines. Humanized antibodies were tested on those who suffer from high-frequency episodic migraine (8-14 migraines per month), and on chronic migraine (15 or more migraines per month) sufferers. Researchers discovered that the humanized antibodies reduced the number of migraine days by up to 6.5 days per month compared to 3.5 days in the placebo group. These findings suggest they can help reduce migraine episodes and are tolerated well by the participants. They are taken as injections and therefore compliance is not as much of an issue as other medications which need to be taken as pills. The side effects were less than other types of

treatment, but they are unable to say what the long-term effects are of this type of treatment since it is only in clinical trials.

Clinical trials have also been done using Simvastatin, which is used to lower cholesterol, and vitamin D3, to prevent migraines and they have been proven to reduce migraine episodes as well. Simvastatin and Vitamin D3 were taken twice daily and were found to have reduced migraines as much as 8 days per month in those in the trial as opposed to the placebo group which was only by 1 day. This is as much as 29 to 50 percent reduction in migraine episodes, which is a great improvement. Side effects of Simvastatin and Vitamin D3 were seen to be the same for patients as reported by the placebo group.

For migraine sufferers like Alexandra and Michael, the hope of new medicines to treat or prevent migraines is a welcome relief.

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